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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT APPLICATION of

Confirmation No.: 7364

TSUKASA MATSUDA et al.

Group Art Unit: 1762

Appln. No.: 10/673,910

Examiner: STOUFFER, Kelly M.

Filed: September 30, 2003

FOR: METHOD FOR DEPOSITING METAL LAYERS USING SEQUENTIAL FLOW DEPOSITION

September 10, 2006 (Sunday)

September 11, 2006

**RESPONSE TO ELECTION OF SPECIES UNDER 35 U.S.C. § 121**

Hon. Commissioner of Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

On August 10, 2006, the Examiner issued a Requirement for Election of Species. The date for responding to this communication is September 11, 2006, due to the intervening weekend.

In the Requirement for Election of Species, the Examiner identified eight (8) distinct species in claim 2 as follows:  $W(CO)_6$ ,  $Ni(CO)_4$ ,  $Mo(CO)_6$ ,  $Co_2(CO)_8$ ,  $Rh_4(CO)_{12}$ ,  $Re_2(CO)_{10}$ ,  $Cr(CO)_6$ , and  $Ru_3(CO)_{12}$ . The Examiner also identified eight (8) distinct species in claim 3 as follows: W, Ni, Mo, Co, Rh, Re, Cr, and Ru.

As discussed with the Examiner and as understood by the Applicant, the Examiner requires the election of one of the metals **and** its associated metal-carbonyl precursor. Claim 38 is representative, as discussed in the written Requirement.

In response to the Requirement for Election of Species, the Applicant elects to pursue claims directed to tungsten (W) and tungsten carbonyl ( $W(CO)_6$ ). At present, all of the pending claims, claims 1-6, 8-20, 22, 24-26, 28-41, 43-55, 57, 59-61, 63-82, read on the elected species.

With respect to the Applicant's traversal of the Examiner's Requirement for Election of Species, the Applicant presents two alternative arguments.

First, the Applicant respectfully submits that the different metal carbonyls differ from one another only with respect to the metal (central atom) associated with the carbonyl

(ligand). Accordingly, the Applicant respectfully submits that all of the metals and their precursor carbonyls should be examined together.

Second, the Applicant respectfully submits that, if the Examiner maintains that the different metals and their precursor carbonyls are patentably distinct species of the invention, the Applicant respectfully submits that the Examiner should at least group the metals according to their classification on the periodic table, specifically with reference to the electron shells shared by each of the listed transition metals.

Before presenting each argument, the Applicant respectfully directs the Examiner's attention to the M.P.E.P. Concerning the Requirement for Election of Species, the Applicant respectfully directs the Examiner's attention to MPEP § 808, which states: "Every requirement to restrict has two aspects: (A) the reasons (as distinguished from the mere statement of conclusion) why the inventions *as claimed* are either independent or distinct; and (B) the reasons for insisting upon restriction therebetween as set forth in the following sections." (Italics emphasis is in original.) In addition, MPEP § 808.02 states: "The examiner, in order to establish reasons for insisting upon restriction, must show by appropriate explanation one of the following: (A) Separate classification thereof; (B) A separate status in the art when they are classifiable together; (C) A different field of search."

It is respectfully submitted that the search and examination of the entire application can be made without a serious burden on the Examiner. Moreover, the Applicant respectfully submits that the criteria for a proper requirement for election of species has not been met. Accordingly, it is respectfully submitted that the Requirement for Election of Species should be withdrawn in its entirety. In the alternative, the Applicant respectfully submits that the Requirement for Election of Species should be withdrawn, at least in part.

As noted above, the Applicant respectfully submits that the claims in the present invention are directed, *inter alia*, to a method including exposing a substrate to a metal-carbonyl precursor gas and forming a metal layer on the substrate from thermal decomposition of the metal-carbonyl precursor gas. All of the gases are metal-carbonyls. The only difference between the different metal-carbonyl precursors lies in the metal (the central atom) associated with the carbonyl ligand. Accordingly, the Applicant respectfully submits that all of the claims share a common thread: all of the claims concern carbonyl precursors and their metals. As a result, the Applicant respectfully submits that there is no undue burden on the Examiner to examine all of the claims at the same time. In other words, it is respectfully submitted that the search and examination for the elected Species necessarily encompasses a search and examination of the non-elected Species.

In the alternative, the Applicant respectfully submits that the Examiner should consider at least grouping metals according to their electron shell configurations, as readily identified with reference to the Periodic Table of the Elements. To assist the Examiner, the Applicant provides a copy of the Periodic Table of the Elements with this response.

As is apparent, all of the metals recited by claim 3 (W, Ni, Mo, Co, Rh, Re, Cr, and Ru) are transition metals. With reference to the Periodic Table of the Elements, the transition metals are found within one of three groups, each of which are defined by the electron shell configuration for that particular group of elements: (1) electron shell VIB, Group 6, encompassing Cr, Mo, and W, (2) electron shell VIIB, Group 7, encompassing Re, (3) electron shell VIIIB, Groups 8-10, encompassing Ni, Co, Ru, and Rh.

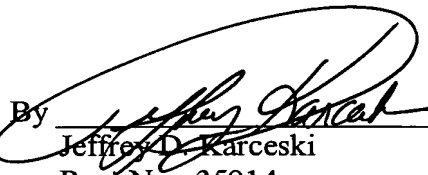
The Applicant respectfully submits that the Examiner, at a minimum, should examine the metals (and their precursor carbonyls) as defined by the electron shell configuration for those metals. As would be understood by those skilled in the art, elements that share similar electron shell configurations behave similarly. While the Applicant recognizes that elements within the same group are not identical, there are certain similarities that cannot be overlooked. Accordingly, the Applicant requests, in the alternative, that the Examiner group the metals according to their electron shell configurations and, thereby, reduce the number of species in the application to three.

Reconsideration and withdrawal of the Requirement Election of Species Requirement is respectfully requested.

Early favorable action on the merits of this application is respectfully requested.

Respectfully submitted

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Enclosure: Periodic Table of the Elements